BUILDING AND ENVIRONMENT

The International Journal of Building Science and its Applications

Editor: C. B. WILSON
Edinburgh University

Volume Contents and Author Index

Volume 28, 1993

PERGAMON PRESS

OXFORD · NEW YORK
SEOUL · TOKYO

Building and Environment

The International Journal of Building Science and its Applications

Editor—C. B. Wilson, *Professor of Architectural Science, Department of Architecture, University of Edinburgh, 20 Chambers Street, Edinburgh EH1 1JZ, Scotland, U.K.*

ASSOCIATE EDITORS

Edward A. Arens, *Professor of Architecture, Department of Architecture, College of Environmental Design, University of California, Berkeley, CA 94720, U.S.A.*

Amitava Deb, *Flat 1/6 W3R Type, Golf Green Complex, Phase VII, Calcutta 700 045, India.*

John S. Gero, *Professor of Design Science & Director of Research, Design Computing Unit, Department of Architectural and Design Science, University of Sydney, N.S.W. 2006, Australia.*

Kenneth M. Letherman, *NORWEB/MANWEB Professor of Building Services Engineering, Department of Building Engineering, UMIST, P.O. Box 88, Manchester M60 1QD, U.K.*

Peter Manning, *Dr, 1470 Summer Street, No. 1601, Halifax, N.S., Canada, B3H 3A3.*

HONORARY ADVISORY BOARD

R. K. Bhandari, *Director, Central Building Research Institute, Roorkee 247667, U.P., India.*

Henry J. Cowan, *Professor Emeritus of Architectural Science, University of Sydney, N.S.W. 2006, Australia.*

Albert G. H. Dietz, *Professor Emeritus of Building Engineering, School of Architecture & Planning, Department of Architecture, Rm N52–487, M.I.T., 77 Massachusetts Ave., Cambridge, MA 02139, U.S.A.*

Harriet Ryd, *Professor, Department of Built Form and Environmental Design, The Royal Institute of Technology, S-100 44, Stockholm 70, Sweden.*

Patrick O'Sullivan, *Professor of Environmental Design & Engineering, Bartlett School of Architecture & Planning, University College London, Wates Ho., 22 Gordon Street, London WC1H OQ8, U.K.*

Daniel L. Schodek, *Professor of Architectural Technology, Graduate School of Design, Harvard University, 48 Quincy Street, Cambridge, MA 02138, U.S.A.*

Steven Winter, *50 Washington Street, Norwalk, CT 06854-2710, U.S.A.*

Founder Editor—A. W. Hendry, *Emeritus Professor of Civil Engineering, Department of Civil Engineering and Building Science, University of Edinburgh, Edinburgh, Scotland, U.K.*

Production Editor—Colin Brown, Pergamon Press Ltd, Headington Hill Hall, Oxford OX3 0BW.

Building and Environment is published quarterly in January, April, July and October

Publishing, Subscription and Advertising Offices:
Pergamon Press Ltd, Headington Hill Hall, Oxford OX3 0BW (Tel: (0865) 794141; Fax: (0865) 60285)

Subscription Rates
Annual Institutional Subscription Rates 1994: North, Central and South America, US$435.00, Rest of World £281.00. Associated Personal Subscription Rates are available on request for those whose institutions are library subscribers. Sterling prices exclude VAT. Non-VAT registered customers in the European Community will be charged the appropriate VAT in addition to the price listed. Prices include postage and insurance and are subject to change without notice.

Subscription enquiries from customers in North America should be sent to: Pergamon Press Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A., and for the remainder of the world to: Pergamon Press Ltd, Headington Hill Hall, Oxford OX3 0BW, England.

Second class postage paid at RAHWAY NJ. Postmaster send address corrections to Building and Environment, c/o Pergamon Press Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A.

Whilst every effort is made by the publishers and editorial board to see that no inaccurate or misleading data, opinion or statement appear in this journal, they wish to make it clear that the data and opinions appearing in the articles and advertisements herein are the sole responsibility of the contributor or advertiser concerned. Accordingly, the publishers, the editorial board and editors and their respective employees, officers and agents accept no responsibility or liability whatsoever for the consequences of any such inaccurate or misleading data, opinion or statement.

Copyright © 1993 Pergamon Press Ltd

VOLUME 28 CONTENTS

Vol. 28, No. 1

A. Baskaran	1	Wind engineering studies on tall buildings—transitions in research
R. El Diasty, P. Fazio and **I. Budaiwi**	21	Dynamic modelling of moisture absorption and desorption in buildings
R. El Diasty, P. Fazio and **I. Budaiwi**	33	The dynamic modelling of air humidity behaviour in a multi-zone space
J. Rao and **F. Haghighat**	53	A procedure for sensitivity analysis of airflow in multi-zone buildings
D. Vytlačil and **P. Moos**	63	The sensitivity analysis of building thermal network elements
J. Jorge, J. Puigdomènech and **J. A. Cusidó**	69	A practical tool for sizing optimal shading devices
D. Butler	73	The influence of dwelling occupancy and day of the week on domestic appliance wastewater discharges
N. N. Dawood and **R. H. Neale**	81	A capacity planning model for precast concrete building products
M. Y. L. Chew	97	The assessment of fire damaged concrete
Announcements	103	

Vol. 28, No. 2

THERMAL EXPERIMENTS IN SIMPLIFIED BUILDINGS

E. R. Hitchin	105	Editorial
P. Wouters, L. Vandaele, P. Voit and **N. Fisch**	107	The use of outdoor test cells for thermal and solar building research within the PASSYS project
H. A. L. van Dijk and **G. P. van der Linden**	115	The PASSYS method for testing passive solar components
T. Dewson, B. Day and **A. D. Irving**	127	Least squares parameter estimation of a reduced order thermal model of an experimental building
P. R. Dolley, C. J. Martin and **D. M. J. Watson**	139	The use of test rooms to determine the thermal performance of a transparently insulated opaque wall
P. Robinson and **J. Littler**	145	Advanced glazing: outdoor test room measurements, performance prediction and building thermal simulation
P. Strachan	153	Model validation using the PASSYS test cells
A. D. Irving, T. Dewson, G. Hong and **B. Day**	167	Time series analysis of test cell field data
C. J. Martin and **D. M. J. Watson**	175	Empirical validation of the model SERI-RES using data from test rooms
E. R. Hitchin, S. R. Delaforce and **C. J. Martin**	189	A comparison of the measured and simulated thermal response of a simple enclosure
I. S. Walker and **D. J. Wilson**	201	Evaluating models for superposition of wind and stack effect in air infiltration
S. R. Delaforce, E. R. Hitchin and **D. M. T. Watson**	211	Convective heat transfer at internal surfaces
J. Littler	221	Test cells: do we need them?
Announcements	229	

Vol. 28, No. 3

A. Dass, R. S. Srivastava and **J. Singh**	231	Utilization of waste chalk from fertilizer industry as filler in building materials
D. C. Okpala	235	Some engineering properties of sandcrete blocks containing rice husk ash
R. Becker	243	A unified methodology for establishing minimum performance criteria and performance grading tools for buildings
K. N. Yu	251	A review of radon pollution in buildings in Hong Kong
K. Sirén	255	The protection ability of the building shell against sudden outdoor air contamination
H. B. de Waal	271	New recommendations for building in tropical climates
K. W. Tham	287	Conserving energy without sacrificing thermal comfort
T. Y. Chen and **A. K. Athienitis**	301	Computer generation of semi-symbolic thermal network functions of buildings
M. Zaheer-Uddin	311	Optimal, sub-optimal and adaptive control methods for the design of temperature controllers for intelligent buildings
M. J. Cunningham	323	Moisture transfer in roof sections under cyclic conditions and constant air pressure difference—laboratory and modelling studies
R. Becker	333	Effects of heating patterns on internal surface temperatures and risk of condensation
M. G. Davies	347	Heat loss from a solid ground floor
B. R. Anderson	361	The effect of edge insulation on the steady-state heat loss through a slab-on-ground floor
A. E. Delsante	369	The effect of water table depth on steady-state heat transfer through a slab-on-ground floor
N. K. Bansal, R. Mathur and **M. S. Bhandari**	373	Solar chimney for enhanced stack ventilation
Announcements	379	

Vol. 28, No. 4

TRENDS AND OPPORTUNITIES IN THE SIMULATION OF BUILDING THERMAL PERFORMANCE AND HVAC SYSTEMS

E. H. Mathews	381	Editorial
M. G. Davies	383	Definitions of room temperature
E. Mayer	399	Objective criteria for thermal comfort
D. Holm	405	Building thermal analyses: what the industry needs: the architect's perspective
E. H. Mathews and **P. G. Richards**	409	An efficient tool for future building design
J. A. Clarke	419	Assessing building performance by simulation
K. H. Yang and **R. L. Hwang**	429	The analysis of design strategies on building energy conservation in Taiwan
P. G. Rousseau and **E. H. Mathews**	439	Needs and trends in integrated building and HVAC thermal design tools

J. Kennington and **P. F. Monaghan**	453	COMBINE: the HVAC-design prototype
N. Morel and **A. Faist**	465	Design tools for building thermal analysis: the significance of integration
R. Amor, J. Hosking and **M. Donn**	475	Integrating design tools for total building evaluation
A. K. Athienitis	483	A methodology for integrated building—HVAC system thermal analysis
S. Hokoi and **M. Matsumoto**	497	An analysis of stochastic properties of room temperature, cooling load and air-conditioning systems
Y. Jiang and **T. Hong**	509	Stochastic analysis of building thermal processes

BUILDING AND ENVIRONMENT—VOLUME 28
AUTHOR INDEX

Amor R., 475
Anderson B. R., 361
Athienitis A. K., 301, 483

Bansal N. K., 373
Baskaran A., 1
Becker R., 243, 333
Bhandari M. S., 373
Budaiwi I., 21, 33
Butler D., 73

Chen T. Y., 301
Chew M. Y. L., 97
Clarke J. A., 419
Cunningham M. J., 323
Cusidó J. A., 69

Dass A., 231
Davies M. G., 347, 383
Dawood N. N., 81
Day B., 127, 167
Delaforce S. R., 189, 211
Delsante A. E., 369
Dewson T., 127, 167
Diasty R. E., 21, 33
van Dijk H. A. L., 115
Dolley P. R., 139
Donn M., 475

Faist A., 465
Fazio P., 21, 33
Fisch N., 107

Haghighat F., 53
Hitchin E. R., 105, 189, 211
Hokoi S., 497
Holm D., 405
Hong G., 167
Hong T., 509
Hosking J., 475
Hwang R. L., 429

Irving A. D., 127, 167

Jiang Y., 509
Jorge J., 69

Kennington J., 453

van der Linden G. P., 115
Littler J., 145, 221

Martin C. J., 139, 175, 189
Mathews E. H., 381, 409, 439
Mathur R., 373
Matsumoto M., 497
Mayer E., 399
Monaghan P. F., 453
Moos P., 63
Morel N., 465

Neale R. H., 81

Okpala D. C., 235

Puigdomènech J., 69

Rao J., 53
Richards P. G., 409
Robinson P., 145
Rousseau P. G., 439

Singh J., 231
Sirén K., 255
Srivastava R. S., 231
Strachan P., 153

Tham K. W., 287

Vandaele L., 107
Voit P., 107
Vytlačil D., 63

de Waal H. B., 271
Walker I. S., 201
Watson D. M. J., 139, 175, 211
Wilson D. J., 201
Wouters P., 107

Yang K. H., 429

Yu K. N., 251

Zaheer-Uddin M., 311